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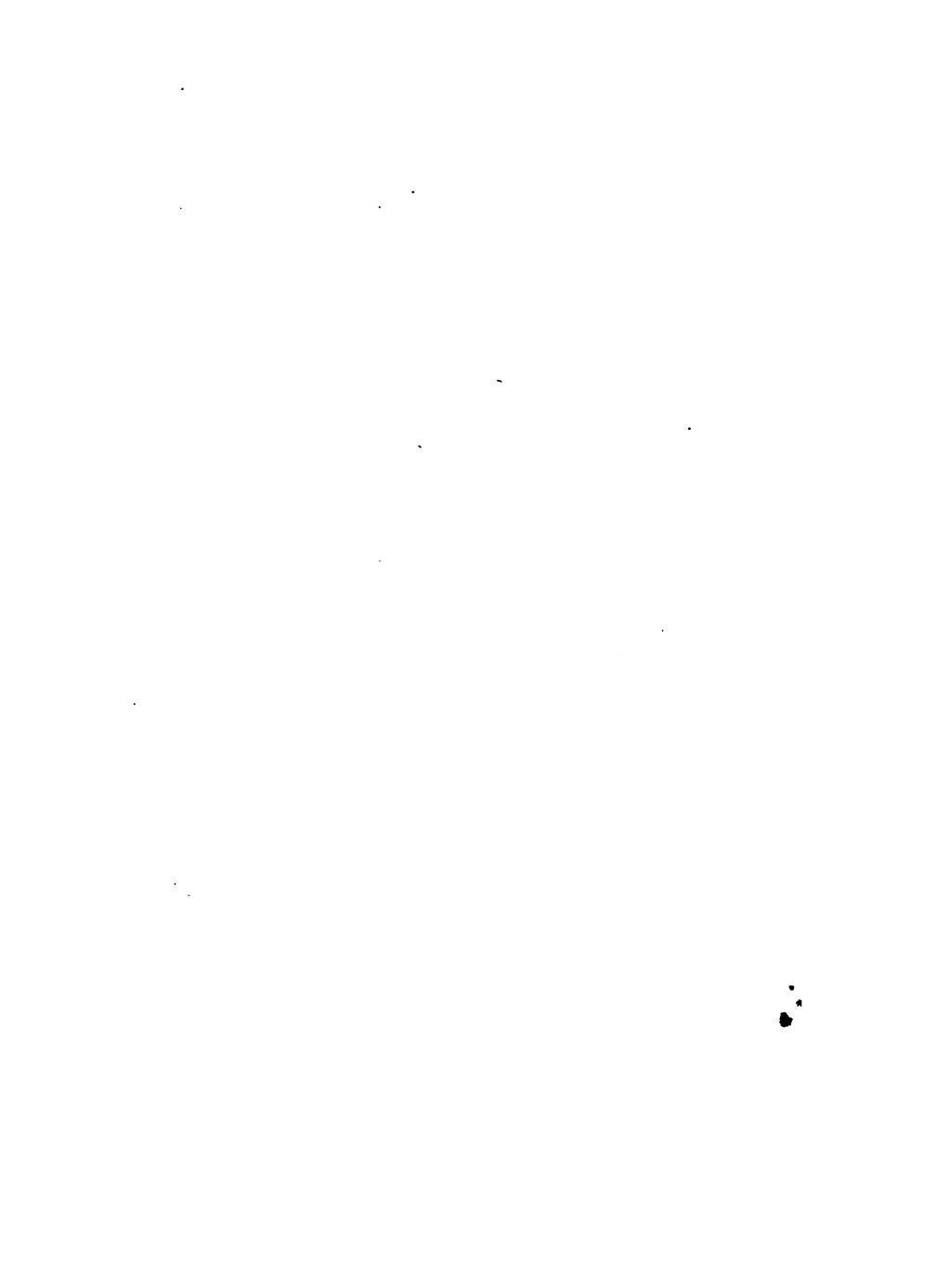
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THE
PHYSIOLOGY OF THE TEETH

POPULARLY APPLIED TO THEIR

CARE AND PRESERVATION:

THE TREATMENT NECESSARY TO

Infantile Diseases coincident with their Development;

AND

THE PREVENTION OF IRREGULARITY

OF THE PERMANENT TEETH;

WITH OBSERVATIONS ON THE DISEASES OF THE TEETH AND GUMS,
THE EXTRACTION OF TEETH, ETC., ETC.

AND

PRACTICAL REMARKS ON THE INSERTION OF
ARTIFICIAL TEETH.



SECOND EDITION.

BY JOSEPH SNAPE,
SURGEON-DENTIST.

LONDON:
LONGMAN AND CO.; GEORGE PRICHARD, CHESTER.

CHESTER :

PRINTED BY W. H. EVANS, FARMERS' HERALD OFFICE, EASTGATE STREET.

PREFACE TO THE FIRST EDITION.

DURING the last few years, so many books on every branch of Dentistry have issued from the press, that it seems almost an absurdity to add another to the list. The fact is, however, that those which have been written for the use of the Profession, enter too much into detail to be of sufficient interest to obtain an attentive perusal by a general reader; and those which have been published in a more popular style, are generally wanting in that explanation which most persons require before they can rely, with full confidence, upon the advice given. It is not sufficient to say, "you must do so and so," without shewing WHY it should be done. A young lady, for instance, (one, perhaps, who has an opinion of her own,) takes up one of those books, and in the course of reading meets with the following sentence:—"In cleaning the teeth *cold water* should never be used, as it is sure to injure them."—"That I am sure it is not!" immediately exclaims

the fair reader :—"Grandpapa is now seventy-six—he has not lost a tooth; and he always uses cold water!" Perhaps, in mere opposition to the advice, she persists in the use of it, to the injury, if not the destruction, of many of her teeth;—ignorant of their being of a much more delicate texture than those of the old gentleman. Were it explained to the young lady, that within the substance of the hardest tooth are innumerable channels through which various little vessels pass;—that if cold water be applied, it may cause those channels to contract; in consequence of which, the fluids contained in the vessels will not freely circulate; and whenever circulation is impeded, inflammation is produced,—and that inflammation in the bony substance of a tooth almost invariably terminates in disease:—it is possible that she might for once conceive herself mistaken, and be convinced that "Grandpapa's teeth" are constitutionally so good, that in spite of the perils to which they have been exposed, they have still remained sound. At any rate, she will be afraid, for the future, intentionally to submit her own to similar danger.

My object in publishing this little Work, is to present (so far as it lies in my power) to the general reader, *a short rational view of the Physiology of the Teeth*, applied to their care and preservation; which, when we consider their uses, and

connexion with the general system, become evidently important. Our first chapter we have devoted to this purpose, and have shown, that a good set of teeth is the greatest ornament to the face, and that with such an ornament it is impossible for a countenance, however ordinary in other respects, ever to be decidedly plain. On the contrary, if the teeth are lost, diseased, or even discoloured, it is equally impossible for a face, however fair or well-proportioned, to appear handsome or pleasing;—that the loss of teeth offends not only the eye, but the ear,—a well-regulated set being indispensable to a correct and agreeable utterance;—that life and health depend upon the perfect or imperfect manner in which the teeth perform their office as organs of mastication;—and that, in some cases, remote organs of the body become deranged by sympathetically participating in their diseases.

The principles laid down, and the treatment recommended, in the remaining chapters, are such as I have, in practice, most successfully acted upon for years. Most of the cases given, came under my own observation; nor have I presented any from other writers for the want of not having seen similar ones, but simply that in the mouth of two or three witnesses the facts brought forward may be established. Aiming more at utility than at originality, I have quoted from any author whose observations coincided with my own; or when it

answered the purposes of my arrangement better, I have condensed his views,—feeling, that should I give my own, they would be a mere copy of his ; and the probability would be, that they might not be so effectively or clearly expressed. Should my efforts be of service to any of my fellow creatures, I shall feel myself amply repaid.

CHESTER, 1840.

PREFACE TO THE SECOND EDITION.

THE Author has great pleasure in presenting a Second Edition of his little work to the public, having the satisfaction of knowing that the publication of the First Edition has been of considerable service to numbers of persons who have perused it. He has been written to by parties, who have benefited by it, from distant districts of this country, and many parts of the continent, and even from India; he has also the gratification of knowing that it has been of great service as a guide, when consultation with a scientific practitioner was impossible.

In issuing this Edition, the Author begs to state that the whole has been thoroughly revised, and much additional matter introduced—the chapter on artificial teeth has been considerably enlarged—and the character of the work altogether improved.

CHESTER, JAN., 1851.

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CHAPTER I.

THE CARE OF THE TEETH NECESSARY AND IMPORTANT.

WHETHER we regard the beauty or utility of the mouth, it forms a principal and an important portion of the human subject. Around it are collected the smiles of affection, and in its variations we may see the change, and read the intensity, of every passion. By means of the mouth, too, man exercises that peculiar and noble faculty—the faculty of speech—which so widely distinguishes him from all other animated beings, and enables him to amuse, to instruct, or to command, his fellows

The mouth, too, is fitted up with an apparatus for cutting, contusing, and mixing our food with saliva, and thus preparing it for the action of the gastric juice in the stomach; so that, whenever any of its parts are either diseased or lost, great inconvenience is not only

experienced, and deformity produced, but almost every organ in the system becomes sympathetically affected and disturbed.

No smile is ever seen to play about a toothless mouth. Anything that would excite one, only produces an unsightly contortion of the muscles of the parts; and those things that afford amusement to the generality of persons, involve those who are destitute of the beautiful organs of mastication, in an unpleasant, if not in a painful, dilemma; and this is made evident to all, by the manner in which the hand is almost instinctively raised, to hide deformity. Nay, if the teeth are even discoloured, or the gums wasted away, although the other parts of the face may be well proportioned and beautifully formed, an appearance is given to the whole countenance which is anything but pleasing, and often calculated to create disgust: but when the teeth are lost, the whole expression of the countenance is changed—the symmetry of the face is gone—and it looks but a wretched mockery of its former self.

A well-regulated set of teeth is not only necessary to beauty, but indispensable to a *correct and perfect* enunciation. If only one

front tooth is lost, though the voice in other respects may be ever so melodious, a disagreeable lisping is produced, and it is with the greatest difficulty that some of the consonants are enunciated. In fact, it is in consequence of the great influence the teeth have in the pronunciation of the letters *t, d, s, z, j*, and the double consonants, that they have obtained the name of *dentals*. Besides, you cannot stand close to an individual who has lost a front tooth, and hold a conversation with him, without receiving, upon your own person, spots of saliva, which are unconsciously forced through the defective space, every time he endeavours to give a word commencing with any of the before-mentioned letters its proper sound. On the contrary, if there is a supernumerary, or an irregular tooth, in the front of the mouth, an abrupt and otherwise imperfect enunciation is occasioned. The mouth may, indeed, be looked upon as a musical instrument; and, when complete, is much more perfect and melodious than any that can be constructed by art:—none can produce such variations, or give to its tones such varied modulations. The teeth, it should be remembered, form an

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important portion of this instrument. If, then, only one is lost from the front of the mouth, it as though the drum were burst, or the flute cracked—its fine tone and power of modulation are gone. On this account dramatists or professional singers, never lose even a back tooth without having its loss supplied, whenever it can advantageously be accomplished.*

Setting however all other inconveniences aside, the teeth are the organs of mastication ; and whenever they are either diseased or lost, this process—upon which life and health are so very dependent—is imperfectly performed, and disorders of the stomach, liver complaints, and a whole train of calamities, arising from nervous irritability, are the consequences ; as will become plainly evident by looking at the mouth from another point of view. If we now view it as a mechanical apparatus, we shall find it much more exquisitely arranged for the purpose of reducing our food to an uniform pulp, than many persons would suppose. The *incisores*, or front teeth are admirably

* *This* can never be done, unless the adjoining teeth are quite sound, and the gums perfectly healthy. Should this not be the case, an artificial substitute would be of no value, and might be the means of producing much mischief, by exciting considerable local irritation.

formed for cutting the food, and the *molares*, or back teeth, to grind it; and each are most conveniently situated for the performance of their respective offices. The tongue, from its extreme flexibility, is exquisitely adapted to collect and turn the food about, so that fresh surfaces may be constantly submitted to the action of the teeth; and it is an interesting fact, that whilst these organs are actively engaged, their very motion acts as a stimulus to the salivary glands, which are situated in their immediate vicinity, causing them to pour out their contents; which, by mixing with the food, reduce it to one homogeneous mass, deprive it of its original colour and taste, and thus fit it for the subsequent process of digestion: and it should ever be remembered, that unless the food is, in this manner, thoroughly comminuted and mixed with the fluids of the mouth, it will be unfitted for this process, and a derangement of the health will be the consequence.

To make this evident, we need only observe that *chyme*—that is, the substance into which our aliment is converted in the stomach—is produced by the gastric juice acting first upon the *surface* of a particle of food, then, by the

action of the stomach, the chyme thus formed is removed, and the under surface is exposed; which, in its turn, becomes acted upon, and is again removed. But, as the energy of the digestive function diminishes, every successive action of this kind becomes more feeble than the one which preceded it; until, at last, the remaining aliment ceases to be acted upon at all. It will, therefore, be seen, that when unmasticated food is introduced into the stomach, that, as the gastric juice acts only upon the surface, before it can have time to affect the whole of it, other changes of a chemical nature take place. Hence arise those acid eructations, pains in the stomach and bowels, and that nausea, which are invariably occasioned by the presence of undigested food. If, then, the teeth are diseased or lost, this process cannot be efficiently performed.

It is observed by Dr. A. Combe,* that, “unless the food is properly masticated and mixed with the fluids of the mouth, not only does a portion of it remain undigested, for want of being properly broken down, but more food is liable to be introduced into the stomach than

* See his *Work on Digestion Dietetics*.

the gastric juice is capable of converting into chyme." He also further observes, that, "as due mastication is thus essential to a healthy digestion, the Creator, as if to ensure its being properly performed, has kindly so arranged, that the very act of mastication should lead to the gratification of taste—the mouth being the seat of that sensation. That the gratification of taste was intended, becomes evident when we reflect that nature, even in eating, makes it our interest to attend to the process in which we are, for the time, engaged." For example, when food is presented to a hungry man, whose teeth are sound, and his appetite good, the saliva begins to flow at the very sight of a dish; and, from the very manner in which he masticates his food, it is evident that what he takes is not only eaten with a relish, but that its digestion will be easily effected.

This is not the case with an individual whose teeth are either diseased or lost. Although he may have fasted equally long, he is not only deprived of the gratification of taste, but, if his teeth are diseased, is subjected, in *some instances*, to the most excruciating pain;

to avoid which, he is glad to swallow his food wholesale—(if they are lost, he is compelled to do so); which, for want of being thoroughly broken down and mixed with the fluids of the mouth, will lie upon the stomach for hours unchanged.

Having shewn how very dependent the health is upon the manner in which the teeth perform their office of mastication,—and, consequently, how necessary it is, on that account, that they should be carefully attended to,—we may also observe that other reasons, equally strong, may be urged against that neglect by which so many persons suffer so severely. Many intractable disorders, in remote parts of the body, are produced by participating, by nervous sympathy, in the diseases of the teeth; and no doubt that most of my readers have been taught, by experience, how widely the whole body shares in the annoyance arising from tooth-ache. Sometimes this disturbance proceeds to an alarming extent, causing most painful disorders,—especially where this source happens to be overlooked. The following cases will afford an illustration:—

A young woman had, for a considerable

length of time, been suffering from pains in her head, which were a cause of great misery to her, and eventually deranged her general health to an alarming extent. In this state she took the advice of several medical men, most of whom considered that she was labouring under dyspeptic affections, (her stomach was, indeed, sadly deranged) and she was treated accordingly. After having been dosed and dieted in every way that was thought calculated to afford relief, without success, almost in a state of despair, she applied to a medical gentleman, who related her case to me. He, from a careful consideration of her symptoms, conceived that they might result from nervous irritation existing near the part. This induced him to ask whether she ever suffered from tooth-ache? "My teeth, sir," she replied, "are in a very bad state:" and, upon examination, the two canine teeth on the upper jaw were found to be carious. Upon being pressed, the pains in her head were greatly aggravated. My friend urged their removal, which was allowed. In the course of a few hours the pains in her head were greatly alleviated, and *in a few days left her altogether. Her general*

health gradually, but rapidly, improved. In a very short time she became perfectly well: the extraction of the teeth being the only plan adopted, and was completely successful.

The second case is that of a physician, who resided in the north of England. This gentleman had, for a considerable length of time, suffered great inconvenience and uneasiness of mind, owing to a deep and unmanageable ulcer, situated in the centre of the tongue. This had remained some months, getting neither better nor worse. All the medical men to whom he shewed it, expressed a very unfavourable opinion of the case. Having, however, an occasion to go to London, he availed himself of the opportunity of taking the opinion of some of his medical friends; who all agreed as to the malignant appearance of the sore, and strongly urged him, upon his return to the north, to take the opinion of some of the many very eminent surgeons connected with the college in Edinburgh. Upon his return home, however, his attention was drawn to the subject of ulcerations of the mouth occasioned by the irritation of decayed teeth. This led him to have his teeth carefully examined;

when one of the *molars* in the lower jaw was found to be carious, which being pressed, he felt the irritation extending to the root of the tongue. This induced him to have it extracted; and, from that time, the ulcer began to assume a more healthy aspect, in a short time became completely healed, and has, ever since, remained perfectly well.

From these cases it is seen that two distinct, very painful disorders, originated in the same cause; and cases might be brought forward, to shew there is scarcely an organ in the system that is not liable to derangement by this sympathetic participation in the diseases of the teeth. Dr. Ashburner relates a case of a man who became paralytic on the left side, owing to some decayed teeth, which proved irritants to the nerves of the jaw; by the removal of which, he was restored to health.* Mr. Bell relates a case of a French gentleman who was troubled with an occasional loss of power in the right arm, owing to a diseased condition of a molar tooth.† A very similar,

* See Dr. Ashburner on Dentition, p. 102. I could wish that all parents were in possession of this little book.

† See Bell on the Teeth, p. 324.

but much more complicated case, came under my own observation a year or two since.

A young lady, seventeen years of age, consulted me respecting a diseased molar (or back) tooth, which was giving her considerable pain. She had an objection to its being removed, and wished me to make some application that would obviate the necessity of extraction. I saw no reasonable prospect of accomplishing what she desired, yet, as her objection to the operation was so great, I scarified the gum, and recommended some simple application, requesting her to see me again in the course of a few days. She did so. The pain, though mitigated, was not removed. Still, however, she objected to losing the tooth. Whilst remonstrating with her on the folly of not submitting to so trifling an operation, I related to her several cases similar to those I have here given. She seemed highly interested, and, after asking many questions about them, told me that for upwards of two years she had had a pain between her shoulders, and that, occasionally, she lost all power of her right arm; and this invariably took place whilst taking tea. The medical gentleman who had

been consulted, conceived that her symptoms were occasioned by some affection of the spine; and at his request she had gone to the sea for several months during the last two summers. I then told her that the tooth (which, she said, had been decayed the whole time) was sufficient to have caused those affections; and requested her to shew it to her medical adviser, to whom she had, hitherto, never mentioned it—not conceiving that it had anything to do with her other ailings, and fearing that he would at once insist upon its being extracted. He perfectly agreed with me; and the offender was removed. Several months afterwards I saw the lady again; and although the pain in her back was not quite gone, she had not experienced a return of the loss of power in her arm. A few months after the last interview, she again called upon me. She had then had a return of it; and said, that although not aware of having a decayed tooth, she was persuaded that something was the matter with some of her teeth. I examined them, and found all sound; but I also found that one of the temporary *molars* had never been removed, and that it was exerting a

deleterious pressure upon the succeeding permanent tooth, which it had forced into an unnatural position. I removed the temporary tooth. Since that time, the young lady has completed her second dentition; when all painful sensations entirely ceased.

Some time since, I was consulted by a gentleman, who complained of pain in one of the upper molar teeth. I advised its removal. To this he objected; partly because he disliked the pain of the operation, and partly because he thought the pain might be occasioned by the general derangement of the system, from cold or other causes; particularly as he felt a degree of feverish restlessness, similar to that which is experienced at the commencement of a cold. I suggested that such symptoms might all originate in the faulty tooth. This, however, my patient could not conceive; and went away, with a determination, as he said, to see how it would go on. The next morning he called again; he had not slept during the night, for pain in the tooth; the feverishness had not only increased, but he was now threatened with a very severe attack of gout, he had pain in every joint, being scarcely able to bend either

his toes, or fingers. The tooth was now removed, and to the great gratification of both parties, in less than ten minutes, the pains in the face were quite subdued, the feverishness was considerably allayed, the fingers and the toes liberated, and the gout gone. On leaving my operating room, my patient shook me by the hand in such a manner, that my fingers, for some time afterwards, experienced the effects of his cordiality.. He then placed his hand upon my shoulder, looked steadfastly in my face, and, with the most thankful expression I ever experienced, said, "My dear sir, if there is such a place as heaven, you are sure to go there."

It will now be seen that, whether we regard the teeth as the foundation of the countenance—as adjuncts to the music and perfection of the voice—as the organs of mastication—or simply as members of a body which cannot be diseased without one or more of the other members participating in their affliction,—in every respect it is evident, that they demand our care, and are worthy of our most continued attention.

CHAPTER II.

THE ORGANIZATION OF THE TEETH.

THE teeth, by some, have been, and indeed still are, regarded as extraneous bodies, not possessing vitality, and differing, in every respect, from any other portion of the osseous system. It has, however, been proved, in the most satisfactory manner, they *do* possess vitality;—that they are pervaded with nerves arteries, veins, and absorbent vessels, exactly in the same manner as every other organ of the system, and with the exception of the enamel differing from other bones only in being more compact. It is not the *cavity* of the tooth, alone, that is supplied with these requisites to vitality, but they actually enter the very *substance* of the tooth itself; through which it is nourished from the general circulation of the blood, and supplied from the brain with nerves which render it sensible to any diseased action

that may be going on in any of its parts. A few facts will make this appear very evident.

If a tooth be steeped in muriatic, or any other mineral acid, till its earthy matters are dissolved, a portion of animal matter will remain, which, with the exception of the enamel, will retain the exact form of the tooth. This fact itself ought to be conclusive; for in every other instance of such a formation, the vitality of the part is never doubted. It is remarked by Mr. Bell, that jaundice affects the bony structure of a tooth, rendering it yellow; and he observed, in persons who had died by hanging or drowning, the same part coloured with a deep, dull red. This could not be, unless it were supplied with blood-vessels which pervaded its substance. I have, in my possession, a tooth which I removed from the mouth of a gentleman, in which a portion of the bony structure was in a high state of inflammation.

Another proof of the vitality of the teeth, may be deduced from the fact that if the gum and the socket, from any cause, recede from the neck of a tooth,—or if the enamel gets, accidentally broken away,—the most acute *pain is experienced*, when it is touched with
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any thing of a higher or lower temperature than that of the mouth. "The existence of pain," says Dr. Ashburner, "may be considered sufficient evidence of the vitality of an organ. The touching of an exposed portion of the bony substance of a tooth with a sharp instrument, gives pain to the individual. The fracture of a portion of a tubercle, from a good molar tooth in my own mouth, has exposed some ivory; and the application of vinegar, of the juice of a fresh currant, or of lemon, causes great pain." Hence there can be no doubt the teeth are organised bodies: but it must be remembered that the structure of these organs is much more compact than that of any other portion of the osseous system; consequently, they possess vitality in a much lower degree than any other of the bones. This consideration is, of itself, sufficient to account for their various peculiarities.*

I have, in my possession, several anatomical preparations, in which may be seen the manner in which the teeth are supplied with sensibility.

* The development and structure of the teeth has lately engaged the attention of several eminent men, in different countries and in England; and the researches of the late Mr. A. Nasmyth, and Dr. R. Owen, on the same subject, are now published.

The nervous filaments may be seen entering each distinct fang of every tooth. Having passed into the tooth, they expand, and spread themselves over a pulpy substance situated in the centre of each of them. It may be seen, however, that these fine nervous filaments all take their origin from the larger nerve, which lies protected from injury by a channel formed for it in the substance of the bone.

Were we to trace these nerves further back, we should find that they, together with numerous other branches, all take their origin from the fifth pair of nerves, and are distributed about the bones of the face—to the eyes, to the nose, to the mouth, to the tongue, and to the throat; and this will account for those apparently anomalous affections arising from tooth-ache. Sometimes a difficulty of swallowing accompanies an attack; sometimes a pain in the ear, under the eyes, or along the nose. At other times the whole face is so exceedingly sore, that the individual experiences excessive pain upon its being touched in the slightest manner. Nor is it any uncommon thing for pain, produced by a diseased condition of one tooth, to be referred to

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that of another which is perfectly healthy.

Some time ago, a lady called upon me for advice respecting one of her front teeth, which she said was giving her great pain. I examined the tooth, and found it quite sound; nor was there any symptom of inflammation near the part. Upon further examination, I found one of the back teeth slightly decayed. This I immediately conceived to be the seat of the pain; and stated my opinion to my patient. She laughed at the idea of such a thing, and refused to permit me to make an application to it; fearing that, by so doing, I might occasion pain in two teeth, instead of one. Upon my assuring her that her case was not an uncommon one, and that I frequently met with those of a similar nature, she consented to my proposition. I removed the decayed part with a little curved excavating instrument, and washed the cavity with a weak solution of nitrate of silver, by means of a camel-hair pencil. No sooner had I made the application, than the pain in the front tooth subsided.*

* I am frequently desired to remove teeth which are perfectly sound, but which are in this manner, sympathetically affected; and I doubt not but that many sound teeth are unnecessarily sacrificed from this cause. We often hear persons speak of having sound teeth removed, *which gave pain.*

In another instance I was consulted by a young gentleman, twenty years of age. He was suffering violent pain in one of the molar teeth on the lower jaw. I examined the tooth and found it perfectly sound; nor, indeed, did any one of his teeth appear diseased. Conceiving that some little irritation might exist near the part, I scarified the gum, which, at the moment, gave relief; but in less than an hour afterwards, the pain returned with double violence. I then examined his mouth more minutely, when I found one of the *dentes sapientiæ* prevented from making its appearance, being held tightly down by a portion of hard, cartilaginous gum. I immediately passed a small curved bistoury down to the tooth, taking care to make such an incision as would give it perfect freedom. From that moment the pain left him, nor has he, to my knowledge, ever been troubled since.

CHAPTER III.

FORMATION OF THE TEETH.

ALL operations of the animal economy are extremely interesting, but none more so than those which are brought into action in the production of the teeth. Their formation and development, in healthy subjects, are carried on with such exact and wonderful regularity, until their completion, as to excite in the mind of every inquirer the highest admiration.

So early as the second month of the embryo's existence, a soft and gelatinous substance is found lying along the edge of the jaws. In another month, this has assumed rather a firmer consistence, and is contained within a shallow groove of bone ; which forms the first step towards the formation of the external and internal plates of the sockets. In another month, this pulpy substance is divided into *distinct portions*, and corresponding filaments

of bone may be seen shooting across the bony groove. These form the transverse portions of the sockets.

The pulps, thus separated, are the basis upon which the teeth are formed, and each is enclosed in a membrane, or little bag. Having arrived at this stage of their formation, they now begin to ossify, first upon the cutting edges of the incisores, the points of the cuspidate and bicuspidates, and eminences of the molares; from thence over the whole surfaces of their crowns, until they become invested in a complete layer of bone; and so on, one layer is formed within the other, until the process of solidification is completed. If we now take a brief view of the progress of the temporary teeth, we shall be enabled to understand why so many infantile diseases are coincident with dentition; and at once see that the treatment recommended rests, as far as possible, upon the foundation of nature, and not upon the fallible *ipse dixit* of any individual. At birth, the sockets of the temporary teeth are completed, and the pulps are enclosed in shells of bone. As the formation of the *bony substance* proceeds, the teeth continue

to elongate; until, having filled the sockets, they can no longer be contained within them: they then begin to shoot upwards, and to *press against the gum*—a portion of the sac still intervening; but, having performed its office of secreting the enamel, it becomes absorbed at those points where the pressure is first made; and, as this continues, both the sac and the gum become absorbed—until the tooth makes its appearance. As there is an established law in nature, that certain teeth shall be developed at certain epochs, and according to a certain arrangement, it is evident that when *that* law is followed, the teeth, in their progress will meet with the gum in a favourable state for absorption:* but if, from any cause, this law is

* “The approximation to a normal order of eruption of the first dentition, may thus be attempted:—

PERIODS.	TEETH.
Seventh month after birth	Two central lower incisors.
Eighth month	Two central upper incisors.
Ninth month	Two lateral lower incisors.
About ninth or tenth month.	Two lateral upper incisors.
About twelfth to fourteenth month.	Four first molar teeth.
Sixteenth, seventeenth, eighteenth month	Two lower canine teeth.
Nineteenth to twentieth month	Two upper canine teeth.
Twenty-third to thirtieth month	Four last molar teeth.”

Dr. Ashburner on Dentition.

Mr. Bell, in his Work on the Teeth, has given a Table which very nearly agrees with that given by Dr. Ashburner. In a critique which appeared in the *Medical Gazette*, on this portion of the Doctor's book, there is given *Sir Richard Croft's Table*, which differs essentially; as it appears by this,

violated, we cannot but expect that a general derangement will take place ; and this, in fact, is found to be the case. "If, therefore," observes Dr. Ashburner, "in a child's mouth, or in the mouth of an older person, a due process of absorption does not go on when it ought,—if a proper growth does not take place as it should do ; and consequently, if certain teeth do not appear at their correct epochs—or another set fall out when their proper period arrives,—one or more of certain serious consequences may supervene." It will readily be conceived that, when a tooth proceeds faster than the parts which enclose it become absorbed, the pressure upon the gum and the intervening membrane will be very great ; and that the pulps, upon which ossification is still proceeding, are also subjected to a degree of counter pressure. It cannot, therefore, be surprising that such a violent interference with a structure so delicately organised—which is so intimately connected with the whole nervous system—should occasion a derangement of any of the organs of the system in general. Hence

that after the *central* incisors, all the teeth of the upper jaw precede their fellows of the lower—a conclusion which Dr. Ashburner believes to have arisen from the observation of *anormal*, rather than *normal* cases.

from this cause may, and often do, proceed blindness, squinting, deafness, stammering, St. Vitus's dance, epileptic and cataleptic fits, various forms of nervous and painful disease, commonly thought of as tic, hysterical affections; several diseases of the skin—especially nettle-rash, warts, scald-head, ringworm; some bowel complaints; some fevers; and a disease which is a union of most of them—commonly called 'water in the head.' In all diseases from this cause, the medicines used should be directed to the state of the digestive organs and the skin. But it should be understood that no medicine can do more than palliate and relieve the symptoms, so long as the *cause* remains untouched. It is, therefore, only by removing the pressure which has occasioned the derangement, by the free use of the lancet, that any permanent benefit can be hoped for.

Whenever, therefore, there is any derangement which can possibly be supposed to arise from this cause, the gums should be examined; and if there is any heat or redness,—especially if it appears over a part where a tooth is expected—the part should be immediately and *effectually* divided: an incision should not only

be made, but the lancet should be carried down to the tooth itself. Against this treatment there exists many prejudices, which, I am happy to say, are now fast dying away. No person who has had an opportunity of witnessing the benefit which the little sufferers derive from this treatment, will for a moment hesitate to adopt it. The beneficial effects I have myself seen produced by it, would appear incredible to many of my readers, were I to relate them. I cannot, however, refrain from mentioning one, which, to me, was doubly interesting.

I had been from home the greater part of the day; having left my little girl (who was rather more than eighteen month's old) as well and lively as usual. During my absence, she had been attacked with symptoms of the most alarming nature, and upon my return, appeared as if breathing her last. Her skin was dry and hot, respiration hurried, pulse hard and quick, and her eyes appeared almost insensible to light. As soon as possible, I examined the child's mouth, when I found the two canine teeth in the upper jaw *unable to force their way through the gum.* I lost no

time in freely dividing the parts, and had the child put into a warm bath; when, to our great satisfaction, and still greater surprise, in an hour or two afterwards she was running about as well and playful as ever.

When the first dentition is completed, the teeth are twenty in number; viz. two central incisors, two lateral incisors, two *cuspidati*, and four molar teeth, in each jaw. At about seven years of age, these teeth commence loosening, in the course of a few years are all removed, and then succeeded by another set, which, as they are to last through life, are called 'permanent teeth.' They are much larger and stronger than the temporary ones, and are thirty-two in number, sixteen in each jaw.*

* "The first permanent molares usually pierce the gum before the loss of the temporary central incisors; and their appearance may be considered indicative of the approaching change. The following are about the medium periods at which the different permanent teeth are generally cut; but so irregular are they in this respect, that comparatively little dependence can be placed on such a statement. Those of the lower, are here indicated; and they most commonly precede the upper by about two or three months:—

	YEARS.
Anterior molares	6 $\frac{1}{2}$
Central incisors	7
Lateral incisors	8
Anterior bicuspidēs	9
Posterior bicuspidēs	10
Cuspidati	11—12
Second molares	12—13
Third molares; or, <i>dentes sapientiæ</i>	17—19

T. Bell's *Anatomy and Physiology of the Teeth.*

CHAPTER IV.

IRREGULARITY OF THE TEETH.

THE second, or permanent teeth, in some instances are liable to various irregularities; and, as there is no subject connected with operative dentistry which has been viewed so erroneously, or afforded to ignorant practitioners more frequent opportunities for exercising their unphilosophical cruelties, it is one I feel anxious should be generally understood; and trust the following observations will be the means of correcting some of those mistaken views, which many of my readers may have respecting it.

There is what may be called a *permanent*, and also a *temporary* irregularity:—that is, an irregularity which may, and often does, require surgical treatment, to prevent its *becoming* permanent; and one of a mere temporary nature, which seldom requires any other treatment *than most good housewives are enabled them-*

selves to accomplish by means of a strong piece of thread.

Permanent irregularity of the teeth may be occasioned by the absorption of the temporary teeth not keeping pace with the advancement of the permanent ones; by which the latter are forced into an unnatural position, and make their appearance either before or behind the latter. In cases of this description, as soon as the edges of the permanent teeth make their appearance through the gum, the temporary ones, which are preventing them from occupying their natural position, should be removed.

Irregularity may also be produced by a want of due proportion between the arch of the jaw and the size of the teeth. This often appears to be the case at the commencement of the second dentition, and most frequently rectifies itself by the maxillary arch gradually becoming more elongated. But if, when the patient is fifteen or sixteen years of age, the defect assumes the appearance of permanency, then one of the back teeth, or one of the *bicuspid*es, on each side of the mouth, should be removed; but upon no pretence whatever should the

cuspidati (or *eye-teeth*, as they are sometimes called) be subjected to a like treatment. In many cases these teeth, from being developed after the *incisores* and *bicuspidés*, appear very unsightly, and project very much: on this account parents, ignorant of the progress of the development of the teeth, are anxious to have them removed. In the course of my practice, I have known many a beautiful girl disfigured for life, by the sacrifice of these two very ornamental teeth. The deformity may be remedied by removing one of the adjoining small grinders on each side, without affecting, in the least, the symmetry of the mouth.

Mal-formations of the jaw may also occasion an irregularity of the teeth; and the treatment in every such case must depend entirely upon circumstances. It sometimes happens that one or more of the upper teeth close within the bottom ones, or one or more of the lower teeth may close over, or on the outside of the upper ones. Such cases are generally very easily remedied, without any pain, or much inconvenience,—by means of little shields of gold or silver so fixed upon the teeth, that when the mouth closes, a pressure is exerted

upon the irregular tooth, or teeth, in such a direction as will, eventually, force them into their natural place.

In addition to these various causes of irregularity, there is, as we have before mentioned, a kind of temporary irregularity to which almost every child is, in some degree, subjected. If this were well understood, much pain and mental suffering would be avoided. It would then be seen that the treatment which (until very lately) was so commonly,—and even now is too often—adopted, was not only unphilosophical and cruel, but generally occasioned the very mischief it was intended to remedy. To torture a child, by wrenching from its mouth a number of teeth to prevent *that* which every individual who has made himself acquainted with the anatomical development of the parts sees no reason to expect, is barbarity the most cruel and unpardonable.*

The appearance of irregularity of the teeth, which is sometimes seen when a child is about changing them, need not excite fear as to their ultimate appearance; nor should it lead

* It is not to be understood that the temporary teeth are *never* to be removed; on the contrary, whenever they interfere with the progress of the permanent ones, their immediate removal is necessary.

to that hasty and erroneous treatment of which we so often hear. It should be remembered, that about this time the whole body is undergoing a great change, not only in size, but in form; and as the jaws now become gradually elongated, if we do not unnecessarily interfere with the teeth, in nine cases out of ten we shall find that they require no surgical treatment at all. Besides the cruelty and absurdity of the practice, there are other reasons for avoiding the early removal of the temporary teeth. So long as they remain in the jaw, they excite its growth; and by the time they become loose and fall out, the permanent ones are so far advanced as to be ready to occupy their vacant places; and in this manner the symmetry of the jaw is preserved. But if the temporary teeth are removed before the permanent ones are sufficiently forward, the jaw becomes contracted; so that, when the latter are fully developed, there is a want of room for them, when they so crowd and wrap over each other, that it not unfrequently happens they are, in a very few years, all destroyed.

Supernumerary teeth are occasionally found in the mouths of individuals, and often occasion

a very great degree of irregularity. They are exceedingly troublesome, and produce a serious defect in articulation. In almost all cases, the immediate removal of these teeth is necessary: an operation often difficult to perform, unless the whole crown has made its way through the bone, and the contraction of the neck offers a hold for the instrument. But it frequently happens that, by this time, the teeth behind which they make their appearance, are so pushed out of their place, that after the extraction of a supernumerary tooth, it requires a little patience and mechanical ingenuity to replace the protruded teeth in their original position.

CHAPTER V.

THE DISEASES OF THE TEETH AND GUMS.

THE disease to which the teeth are most liable is *caries*, which attacks indiscriminately any part of the tooth, but most frequently the crown. It is first observed as a dark spot, and this circumstance has caused dental pathologists to question whether the disease commences in the enamel, or in the bone of the tooth under it. Mr. Bell, who has done more for the scientific advancement of this branch of surgery than any other individual, adopts the latter opinion.

The observations which I have myself been able to make, lead to the conclusion that the remote cause of *caries* is invariably of a constitutional character, and that it may be developed by local agents or other circumstances with greater or less rapidity.

When we consider that a person twenty

years of age, is rarely found without a decayed tooth, how melancholy the thought! when this is connected with the fact, that the condition of the teeth is a true index of the state of the constitution.

That fact is indisputable; and yet what numbers do we meet with just entering upon the active stage of existence, with all their molar, and, in many instances, their front teeth affected by disease. This state of things ought not to exist; neither would it, were not the laws of health so continually, and so wantonly and daringly violated.—Every animal living in a state of nature, and guided solely by instinct, retains his teeth to the last; and let it be observed, loses them only when worn out by age. Has nature then been less favourable to man? Has the Creator bestowed upon his noblest work, teeth less durable than he has given to the inferior animals? Admitting this not to be the case, how does it happen that so many of the human family lose their teeth at so early an age?

According to the opinion of the most eminent *naturalists* and comparative anatomists,

the natural diet of man is of the simplest kind, consisting chiefly of vegetable matter ; his natural beverage, *water* ! and the pure uncontaminated atmosphere the natural and only proper supporter of his respiration : and were man to live in conformity with the unerring dictates of nature, he would unquestionably enjoy perfect health, and, as a necessary consequence, sound teeth.

The reverse of this is, however, the case. Instead of satisfying the demands of hunger with that simple but wholesome diet, with which the vegetable world so abundantly supplies him, man satiates and pampers himself with the dead, often putrid, and not unfrequently, diseased carcasses of animals, once endowed with life and sensibility like himself. When thirsty, instead of resorting to the fountain flowing with nature's nectar, gushing with health, prepared for him "without money and without price," and possessing qualities in the highest degree refreshing and invigorating, he racks his invention, spends his money, and wastes his time, in preparing fluids, which, instead of quenching, only increase thirst—instead of invigorating, produce

exhaustion—instead of giving health, bring on disease—instead of supporting life, invariably cause untimely and often violent death.

Instead of availing himself of every opportunity to inhale the pure breath of heaven, man—civilized man, immures himself in confined rooms, amidst innumerable impure exhalations, and enveloped in noxious effluvia ; carefully closing every crevice by which any of the contamination might possibly escape, or the pestilential odours be diluted by the admission of the external air.

From the very structure of man's muscular system, it is obvious that nature intended him to lead a life of activity, and to possess both agility and physical energy. Civilization has, however, rendered him sedentary and inactive, and the inevitable consequence has followed—he has become enervated. Man living according to nature can leap over a barrier as high as his head, with far greater ease than the refined, sybaritic voluptuary can bend to tie his shoe: the former knows no head-ache, no heart-ache, no tooth-ache; the latter is ever pestered with one or other, and at some periods never *takes a meal* without finding the legs of all

three of these unwelcome, but inveterate hangers-on, under his table, and even his couch haunted by their hateful presence.

In addition to all these dietetic errors, the mischief is still augmented by the powers of the mind being, from the earliest period of life, stimulated into such incessant and active exercise, that the brain is unable to transmit a vigorous and healthy nervous influence to the various organs of the system.

Whilst the physical and mental machinery are thus kept under this excessively high pressure, is it surprising that some of their parts should, at any time, become deranged by the introduction of the most trifling foreign body? Or, in other words, is it at all strange, that whilst man is thus continually living under this unnatural state of stimulation, the slightest change in the temperature, or electrical condition of the atmosphere, should prove to him morbid; or, that disease of the teeth should follow any injury done to the enamel, by which the bony structure becomes exposed to the action of the atmosphere, that of the saliva, or of any thing that may be put into the mouth, the decomposing influences of which

it is not able to withstand, and from which it is the province of the enamel to protect it? On that subject, it will, I conceive, be conceded, that every rightly constituted mind can entertain but one opinion.

From what has been said, it will, I think, appear tolerably evident, that the remote cause of disease of the teeth, like the remote cause of disease in the other organs, originates in over stimulation.

The local agents, and other causes, which develop the disease are, however, unlike in different individuals—some persons are constitutionally predisposed to it. Whole families have been known to lose one particular tooth; and this has generally happened at about the same period of life. The irritation produced by the first dentition, disorders incident to infancy, mercurial medicines of every description, or anything that has a tendency to increase the circulation, or to produce inflammation, may be an exciting cause: considerable changes of temperature, therefore, whether occasioned by exposure to a cold atmosphere, or by the contact of anything taken into the mouth either so much above, or so much below its temper-

ature, as to produce the least possible sensation of pain in the teeth, may occasion this disease.

The loss of the enamel, which is always followed by the decay of the tooth, may be occasioned in a variety of ways: it may result from imperfect formation, or from accidental fracture. Indeed, when we see the manner in which so many trifle with their teeth,—using them to crack nuts, untie knots, and even (as I have seen) *draw nails*,—and for sundry other purposes for which they were never intended,—we may feel surprised, not that many persons are so much troubled with their teeth, but that the generality do not suffer more.

The enamel of the teeth may also be destroyed for want of room in the jaw: this is most commonly the case with the front upper teeth. When they are crowded together, mutual pressure takes place to such a degree as to break it down at the point of contact, and thus occasion an exposure of the bone; which, from the lodgment and decomposition of particles of food, soon becomes carious; and, as it commonly happens that both the teeth which are thus

subjected to pressure begin to decay at about the same time, a mistaken notion has been entertained, that one decayed tooth causes the decay of the adjoining one; and, owing to this mistake, many a tooth which might have been available for mastication or vocal delivery has been sacrificed.* *Caries* is also very frequently found to be occasioned by the decomposition of the enamel, caused by portions of food remaining between the teeth, and becoming acidulous. Some dentists think that this is the *only* cause of decay; but, although I cannot agree with such an opinion, I do think that more teeth are lost by *negligence*, than by anything else.

The best treatment that can be adopted, is that of removing the decayed part as soon as possible, and filling the cavity with a substance that is not liable to be acted upon by anything received into the mouth: this, when properly performed, under favourable circumstances, is so completely successful, as

* If one tooth is decayed, and the cavity is suffered to remain exposed, there is a greater liability of particles of food accumulating and becoming decomposed, than there would otherwise be; in consequence of which, an adjoining sound tooth may suffer,—not by *contagion of its diseased neighbour*, but from the chemical agency of an acidulous compound with which it unavoidably remains in contact.

permanently to arrest the progress of decay. I have seen teeth which have been successfully preserved for upwards of thirty-six years by the gold-filling; but the result of the operation entirely depends upon the state of the tooth, upon the more or less complete removal of the carious part, the material used, and the mode of operating. Pure gold is decidedly the best substance that can be used; but in many cases the disease has been suffered to go too far for its successful application. When it has gone so far as to render the tooth exceedingly painful, or to produce irritation in the adjoining parts, its extraction is the only remedy. In some instances, however, it happens that (unless the caries has advanced very far) the sensibility of the nerve may be so much blunted, as to admit of a *stopping*, of some kind or other, by means of which the tooth may again be rendered serviceable.*

If the teeth are so far decayed as to be rendered, from the very great irritation that

* There is a great variety of stoppings that may be put in the cavity of a tooth in a soft state, which in a short time harden, and in many instances answer very well; but they are never to be depended upon like gold.

is produced, merely extraneous bodies in the sockets, their removal is necessary to the preservation of general health; and nature endeavours to effect it by a variety of processes: the absorption of the gums and the bony socket takes place to such a degree, as gradually to loosen their roots, by depriving them of their support: a portion of bony matter is deposited at the bottom of the sockets, which, by degrees, forces the root upwards into the substance of the gum: the roots, also, become absorbed at their extremities, so that, in many cases, a small portion only is found to remain.

The removal of such teeth is an exceedingly simple operation to those who understand the process; but many persons, in submitting to be operated upon by individuals totally incompetent, unnecessarily suffer much pain, and incur much risk.

It is related, that in the temple of the Delphian Apollo there was a tooth-instrument suspended, made of lead—to shew that no tooth ought to be extracted but what might be removed by so frail an instrument. Now, if the many pretenders to the dental art would

confine their operations within the limits of this rule, little mischief would accrue ; but, unfortunately, no tooth seems to them too difficult to remove,—and many a fractured jaw and disfigured mouth are the consequences of their temerity.

Simple as the operation may appear, it requires a much greater degree of tact and skill, and a better acquaintance with the anatomy of the parts, than is generally conceived. The extraction of a tooth, even in the hands of a most scientific dentist, is a painful operation ; but how much more so is it likely to be, when the operator is unacquainted with its articulation in the jaw ! When the operation is skilfully performed, and the instruments well chosen, the pain is trifling compared with that which is occasioned by the application of ill-contrived instruments by the hands of ignorance.

Some persons, who have suffered severely from the removal of a tooth, frequently refuse to submit to a similar operation, although the whole system may be suffering from the influence of a diseased one. I regret that it is not possible, without the aid of drawings, to explain how safely and easily the extrac-

tion of any tooth may be effected, when the operation is scientifically performed. I shall, however, be happy to shew my instruments, and explain their mode of application, to any person who may feel interested in the operation.* The construction of the instruments, and their application to each class of teeth, are based upon a strict attention to the anatomy of the parts; and this appears so exceedingly evident to any person to whom it is described, that the most timid will frequently submit to an operation with a degree of courage they little thought it possible ever to possess. The following is a good illustration:—

Mrs. ——— had, during the greater part of her life, suffered severely from diseases of her teeth. She had lost a great number of them. What remained, were a constant source of misery to her. In 1838, she consulted me; and as all her remaining teeth were either dead roots in the sockets, or greatly affected

* I do not presume to any pre-eminence in this department of my profession, but I have no hesitation in saying, that my *method of operating* is less painful and less dangerous than that *commonly adopted*. At the same time, I most cheerfully admit that many other dentists operate in the same manner, or possess other methods of equal merit.

by caries, I recommended their immediate removal. She decided upon having one extracted daily, until her mouth was cleared ; and sat down for the purpose of having one removed at the time. No sooner did I approach with the instrument, than her courage failed her, and she went away without having it accomplished. In the course of the next six months, she called upon me at least a dozen times, having made up her mind (as she fancied) each time to have one removed, and as many times went away in the same unsatisfactory manner. I at last told her, unless she submitted to an operation at that time, I should refuse to see her if she called again ; but, to convince her there was no necessity for the fears she experienced, I explained the manner in which each tooth would be removed. She expressed herself as being both surprised and encouraged, and immediately suffered me to extract one. In a few minutes afterwards she said, "I really think I could bear another out!"—so we went on, until, in the course of half-an-hour, I had removed ten *teeth*, the crowns of which were either wholly, or in part, destroyed by caries ; and on the

following morning, she submitted to the extraction of the remains of six or seven more. This lady told me, that in addition to the number of times she had called upon me, she had come to the door of my house, and returned, at least twenty times.

Salivary calculus—or, deposition of tartar on the teeth—is another disease to which the teeth are liable; which, with the exception of gangrene, is the most common, and at the same time, most destructive. So common, indeed, is this deposit, that every individual is more or less subject to it; and so detrimental is it, that thousands of persons are continually losing their every tooth, by neglecting to have it removed.

The first deposition invariably takes place upon the necks of the teeth, just under the edge of the gum; which, by remaining in contact with it, produces a slight, but imperceptible irritation, which occasions the gum to recede. The next deposition takes place immediately under the former one;—the irritation is, consequently, increased, and the gum *recedes still* further. In this manner the *deposition of tartar* and recession of the gum

gradually go on, until the gum becomes so inflamed and painful, as to render the ordinary process of brushing impracticable. Neglect follows; the gum and sockets are absorbed; the teeth become loose and eventually drop out.

In consequence of the irritation which is, in this manner, occasioned throughout the mouth, symptoms of the most fearful nature are sometimes induced in some of the vital organs: as in the following instance:—

In January, 1837, I was consulted by a working man. When I first saw him he was pale and emaciated, and had the appearance of a person in the last stage of consumption. Such was his weakness, that it was with great difficulty his friends had managed to bring him, in a Bath chair, the distance of a mile. His breathing was so difficult, that, after indistinctly uttering one sentence, he had to wait some seconds before he could proceed. At last, however, with some difficulty, he gave me to understand that he was in a decline, and that his medical attendant had but little hopes as to his recovery:—"But," said he, "*they wished me to see you about my teeth*"

and gums. The pain in them is so great, that I can scarcely take any food, and, from what the doctors say, I am in hopes you can give me some relief: if so, I shall spend the little time I have here with much more comfort to myself and friends." I examined his mouth, and found every tooth encrusted with tartar, and his gums were in a state of the most violent inflammation and suppuration; but so intolerable was the stench that proceeded from his mouth, although both the door and the window were open, I thought I should have been compelled to leave the room. Such being the case, it was impossible for me to operate. I therefore supplied him with some tooth-powder, a brush, and an antiseptic lotion, requesting him to use them three times a-day, notwithstanding the pain it might occasion, and to see me again in a few days. He did so, and I found the inflammation of his mouth very much subdued, and my patient in much better spirits. I then removed the tartar that had occasioned the irritation, extracted one or two teeth which were decayed, and filled up *one slightly affected*. I never saw the man *again; but his wife called upon me about*

three months after, to thank me for what I had done ; and told me, that from that time her husband was a new man ; the health of his mouth was soon restored, his appetite gradually returned, his cough left him, and for the last month he had followed his usual employment : his health had, indeed, she said, been better than it had been for some time before. The poor woman could not suppress her tears in expressing her gratitude.

When the tartar is once formed, in order to prevent it from producing the consequences we have described, the operation of *scaling* must be resorted to ; for it is impossible that this concretion can be removed in any other way. This, however, need not excite the slightest fear—which the idea of having to undergo an operation sometimes does. Scaling the teeth, when skilfully performed, gives little or no pain ; it occasions, on the contrary, a most delightful feeling of cleanliness throughout the mouth, and gives immediate satisfaction ; and if, for the future, this accumulation is *prevented*, permanent comfort will be *enjoyed*.

DIRECTIONS FOR THE PRESERVATION OF THE
TEETH FROM TARTAR.

LET the teeth be well cleaned morning and evening with a well-chosen tooth-brush ;— a hard one is useless, from its want of elasticity, and a soft one from want of strength. In choosing a tooth-brush, see that the bunches of bristles are small and numerous ; by this means it is rendered pliable, and gets more easily between the interstices of the teeth. In using the tooth-brush, it should be moved upwards and downwards, in a kind of rotary motion : it is of little use to brush the teeth horizontally, as, by this means, the prominent parts alone are cleansed, and the interstices remain untouched. The back parts of the teeth are best kept clean with a small brush, the handle of which should be bent a little, below where the bristles terminate ; or by means of a pointed one, which may be inserted between the teeth. With these brushes, and the assistance of a little tooth-powder, they may generally be kept quite clean in every part. Care, however, should be taken, as to *what kind of tooth-powder is used, as all those powders recommended for rendering the teeth*

white, can only produce this effect by acting upon the enamel chemically; and whatever does this, must inevitably destroy its structure. The action of tooth-powders should be simply mechanical, and those which have chalk for their basis are decidedly the best. Charcoal is spoken highly of as a dentifrice, but it is decidedly objectionable for two reasons: in the first place, it cuts through hard substances like emery, and will destroy the enamel mechanically; and in the next place, it is too dirty to put into the mouth, or, indeed, to stand upon a dressing-table. As an ordinary tooth-powder, camphorated chalk,* properly prepared, will be found a very good, and always a safe one.

There are other diseases to which the teeth are liable; some of which I shall briefly describe.

Exostosis of the teeth, is a preternatural deposition of bony matter, increasing the substance of their fangs. The pain it occasions is dull, and deep-seated; in some instances,

* Some persons, whose gums are relaxed or spongy, will require a more stimulating powder. They had then better take the opinion of a dentist, than run the risk of destroying their teeth by purchasing any of those powders which are so pompously announced in the daily papers.

remittent; in others, incessant. Bleeding, by means of leeches, has sometimes afforded relief; but the extraction of the tooth will alone render that relief permanent. The disease being confined to the fangs, it is sometimes difficult to determine which to remove; but as it seldom happens that teeth which are in this manner diseased, are not affected more or less in other respects, and when smartly struck are exceedingly painful—an experienced practitioner will seldom be mistaken.

Necrosis, or death of the teeth, is a disease originating in inflammation, and terminating, as its name indicates, in the complete loss of their vitality. This inflammation may be excited either by external violence, sufficient to loosen or displace the tooth; may result from the effect of salivation on the dental membrane; from the absorption of the alveoli, with the advance of age; and several other causes.

The colour of a tooth so affected, becomes bluish, and in this condition will sometimes remain for years without producing any bad effects; but it has, in most instances, a *tendency to separate from the sockets*, and then *its immediate extraction is the only alternative*,

as that alone will prevent an extension of the irritation.

Fractures and dislocations of the teeth are often occurring. In such cases professional assistance is indispensable. If, however, a tooth be dislocated, and no such assistance be available at the time, it should be carefully replaced in its natural position, and the mouth rinsed with warm water; but any unnecessary procrastination in obtaining professional aid, would be almost certain to incur a severe penalty.

DISEASES OF THE GUMS, ETC.

THE disease to which the gums are most subject, is known by the name of Sponginess. Formerly it was called, (but most erroneously) "scurvy in the gums." Sponginess arises from inflammation, which is generally induced by the presence of tartar, the use of mercurial medicines, cold, and other irritating agents, which cause a larger quantity of blood to enter the vessels of the gums, than from their inactive state they are able to return. In this surcharged state, they become enlarged and *are loosened from the teeth—sometimes entirely*

separated from them; their sensibility is often so greatly increased, as not to be able to bear the slightest friction of a tooth-brush, and even the most trivial touch will cause them to bleed profusely.

The best treatment that can be adopted is the removal of the cause of irritation, scarification of the gums, and the application of some simple astringent lotion.

Abscesses, or gum boils, are generally attributable to inflammatory action, occasioned by fangs destitute of vitality remaining in the gums; and they will often continue a considerable time, alternately healing and discharging. Exposure to cold, or derangement of the digestive organs, will also frequently occasion them to arise. Removal of the dead fangs, scarification of the gums, and warm fomentations, are the most effective treatments.

CHAPTER VI.

ARTIFICIAL TEETH.

SOME persons who have lost their teeth, neglect their artificial restoration—so necessary to articulation and appearance—so conducive to comfort—and so essential to health, owing to their non-apprehension, from prejudice or false impressions, of their utility and importance. If, however, the preservation of the health be a concern worthy of solicitude, when we remember how much that depends upon the manner in which the teeth perform their functions, their restoration by art can neither be deemed an act of vanity or one of hyper-punctiliousness. When we also take into consideration, that the insertion of artificial teeth occasions neither pain nor inconvenience, who, we ask, in possession of this knowledge, would voluntarily present themselves, day after day, among *their friends*, with deficiencies so opposite to the

requirements of society, so prejudicial to health, and so detrimental to vocal utterance, and personal appearance?

Artificial teeth, if skilfully and judiciously supplied, afford greater advantages than substitutes for any other part of the human frame. An eye, a nose, a leg, or an arm, may be artificially restored, so as to deceive observers in general, but in secret the patient himself mourns over their inefficiency. Artificial teeth, however, approach so near to perfection in performing the functions of the natural organs, as closely to approximate to a full compensation; and, in many instances, the wearer becomes unconscious of labouring under a natural defect.

As no other branch of artificial surgery has arrived at such perfectibility, so none requires, in its practitioner, more ingenuity and nicety, in combination with a scientific comprehension of the anatomy, physiology, and pathology of the teeth and their adjacent parts. He should also possess and evince moral courage; be prompt, alert, and dauntless; and with these *qualifications* there should be united a *conscientious determination* to depart, in no instance,

from the true principles of science, either to humour the patient, or to promote any mercenary purposes of his own.

This is an exceedingly difficult stand to take, and, perhaps, a more difficult position to sustain; it is nevertheless the only one in which any dentist can honourably succeed.

In cases of tooth-ache, the useless and irrational practice of *excision*—or the cutting off of decayed teeth—has nearly, if not entirely, fallen into disuse: but unfortunately, even now, (either from ignorance or want of principle,) in cases where artificial teeth have to be inserted, it is too commonly adopted. This is done under the plea that it prevents the gums from sinking, and the cheeks from falling in. That it eventually does neither, but that the worst consequences almost invariably result, when the dead roots are left in the sockets, the following very judicious observations of Mr. Bell* will very clearly show. In speaking of the operation, he says,—“It is irrational in its principle, often useless in its immediate effects, and in its consequences most pernicious. It has always appeared to me to place the

* Bell on the Teeth.

operator in a dilemma of evils. The object is, I presume, to cut through, or rather break off the tooth, so low as to remove the whole of the crown, including the cavity which contains the pulp or membrane. If this object be effected, the consequence is, that the dead roots remain in the alveoli; and these, if not immediately productive of pain, may yet be expected to occasion much future suffering, as extraneous irritating bodies. Every one knows what is the usual result of the existence of dead roots in the jaw, when they have been left either by accident in an attempt at extraction, or by the gradual decay of the crown;—and is it not surely too much to adopt, as a *useful operation*, that which every one deprecates as an *accidental occurrence*! If, on the other hand, (as, indeed, it frequently happens,) the object aimed at be not fulfilled, the case is placed in a situation incomparably worse than before,—the nerve being still more exposed, and the hope of the ready and easy extraction taken away, by the loss of that part of the tooth which would have afforded a solid support for *the instrument*. . . . I could say much more, *and illustrate* and confirm these observations

by cases sufficient in number and severity to deter any rational practitioner from adopting so injurious an operation."

Some time since, I was applied to by a lady in want of some artificial teeth. There were several dead roots remaining in the jaw, and the gums were very irritable. When I told her that before she could derive any permanent benefit by their insertion, the fangs must be removed, and the mouth generally got into a more healthy state, she declined the operation; stating that she could get them done in Liverpool without having the roots extracted. In vain did I tell her, more than once, that the result would not, eventually, be satisfactory;—she knew many who had had them done so!

Some time afterwards I saw the lady again. She had been to Liverpool, and the teeth were inserted. She exultingly told me they answered very well. I, of course, could say nothing; and doubt not she fancied I regretted the position previously taken. Which of us had the greatest reason to regret, the result proved. In about two months after, I was sent for by the *same lady*. She had suffered some pain in her mouth the evening before. Through the night

it had increased so much as to deprive her of sleep; and when she rose in the morning, her mouth was so inflamed, and her face so swollen, that she became alarmed.

I attributed the whole to the irritation produced by the dead roots which were left in the jaw. Still, however, she objected to their removal; and wished me to employ some more gentle remedy. I at once told her that it was useless trifling, and that I could be of no permanent service to her unless she submitted to what I proposed. Her medical attendant was sent for, and he did what was best in such a case—applied roasted figs and fomentations, which soon afforded relief; but, most unfortunately, about a fortnight afterwards, in returning home from an evening party, my refractory patient took cold, and had another, but a much severer attack. I was again sent for; the fangs were removed, and when I called the following day, she was perfectly well. The artificial teeth she then had, soon became useless from the altered state of the gums; and when the gums were thoroughly healed, I made her *a set, which she is now wearing with the greatest comfort.*

The difficulties to be overcome, differ in almost every case ; but whatever character they may assume, the above shows how necessary it is that the mouth should be rendered perfectly healthy, before an artificial restoration can be either permanently comfortable or beneficial.

There are several methods employed, in the present day, of inserting artificial teeth. One dentist, himself more skilful in inserting them in one way than another, writes a book to show that his way is best, and all others wrong. One recommends teeth made of the hippopotamus' tooth alone: another, hippopotamus-sockets with natural teeth ; others, gold plates with natural or mineral teeth. But after all, more depends upon the health of the mouth, and the manner in which artificial teeth are inserted, than upon the material of which they are made. I must say that, in a general way, I prefer gold plates, with composition, or mineral teeth, as they are more durable, and can always be kept perfectly clean and free from taint, which is not possible when made of any animal material, however *hard*.

I would here wish to guard my readers against a mistaken idea that has somehow or other taken possession of the minds of many persons, which is, that these teeth will endure indefinitely, let them be subjected to what usage they may. It is true they cannot be worn away by mastication; nor is their colour liable to change or be otherwise decomposed by the fluids of the mouth. They are, however, all liable to accidental fracture, and some persons are so unfortunate in the wear of them, as not to be able to use them for even a short period without a breakage. This happens, not from their being made of inferior materials, or from an incorrect arrangement, but from a peculiarity in the closing of the mouth of the individual, as the teeth, whether of the English, French, or American manufacture, are all subject to it—and this, whether the bite be close or open. These, however, are *rare cases*; on the contrary, the great majority of artificial teeth worn are of this class, and they are used for years without an accident, and when, after long usage, they are thrown aside, together *with their owners*, they look as fresh, and are *as firm as on the day they were first made*. If

natural teeth are used, they are certainly not liable to break ; on the contrary, they soon begin to soften and decay, and generally require renewing from every two to five years—although there are instances occasionally of their being worn fifteen or twenty.

Artificial teeth may also be attached, by means of gold pivots, to the roots which remain in the mouth, after the bodies of the teeth have been destroyed by disease, or otherwise broken. One writer* says:—"This is by far the most imperceptible mode of fixing artificial teeth ; and when properly done, a tooth kept up in this way will often bear a minute examination, by an experienced dentist, without being discovered ; and may be used with as much freedom by the patient as any of the adjoining natural teeth." Such teeth can, however, only be inserted upon the fangs of the six upper front teeth.

I must say that I do not like the plan. It would be irrational to expect it to be *permanently* successful. I, therefore, never adopt it, except in some very rare instances. There is no satisfaction in doing things by halves ; and

* Jobson on the Teeth, p. 230.

when there *is* one plan which we know will succeed, and another, the success of which is problematical, good policy will always give the former the preference. It may, indeed, prove a little more inconvenient to the patient, and irksome to the practitioner, but eventually both reap the benefit ;—the one, from the great comfort derived from a preparation properly effected ; the other, from the success which invariably attends a conscientious discharge of duty.

In inserting complete sets of artificial teeth, practitioners, with few exceptions, have, in a great measure, neglected to take nature as a guide. It often happens, therefore, that where such preparations are worn, the mouth has a contracted and unnatural appearance. In a well developed mouth, in its natural state, the crowns of the teeth only are seen, varying in length from about a quarter of an inch ; but the teeth themselves are, however, about an inch long, three parts of which, viz. the fangs, are concealed by the gum and the sockets in which they are embedded. When all the teeth *are lost*, nearly the whole depth of the alveoli, *i. e.* the bony sockets which enclose the fangs,

is absorbed, so that the gum, both in depth and thickness, is very sensibly diminished. A mistake very generally made, and which claims the attention of all who are personally interested in the subject, is, that notwithstanding all this loss of substance, many dental practitioners so fix artificial teeth that when the lips are opened, their short crowns only, which constitute their whole length, are seen, precisely as if no absorption had taken place. In consequence of which—no allowance having been made for the loss of substance, either in thickness or depth—the length of the countenance is diminished, and, in many cases, the interior of the mouth so contracted as to impede articulation. Hence it is, that the mouths and lips of so many persons, wearing artificial teeth, have an appearance so sunken and wrinkled—giving to comparative youth the aspect of shrivelled age, and to robust health, the look of the valetudinarian.

The discovery of the cause of these inconveniences naturally suggests the remedy. If the space the fangs of the teeth once occupied, *but which*, owing to absorption, is now lost, *were restored*, the deformity would no longer

exist, and the other inconveniences would be obviated. It must be evident, even to the most superficial observer, that when artificial teeth are required, they should be inserted in such a position, and of such a length, as to restore to the face its original contour. If, therefore, we take as a model a well formed skull with the dental organs entire, and dissect away three-fourths of the depth of the alveoli, we then, as nearly as possible, get the true natural position and length of the teeth. That then should be our guide in attempting their restoration. It is true, when a preparation so constructed is for the first time employed by any person who has been long without teeth, or who has worn preparations of other make, a most unsightly appearance is given to the whole countenance; the mouth appears to project; and there is great difficulty in closing the lips, which, in many cases, occasions a grotesquely hideous grin; and as an inevitable consequence gives rise to much, but happily only *temporary*, dissatisfaction, especially when vanity takes the alarm, at what looks like a compromise of personal beauty. As this sentiment pervades more or less every human mind,

the dentist must consequently be prepared to encounter many a lovely face suffused with the hue of anger; many a bright eye flashing indignant lightnings; and many a silver-toned tongue giving utterance to mimic thunders. Patience is *his* only remedy—patience only can he prescribe for his *patients*.

No sooner, however, are the muscles of the parts, which had become contracted from disuse, again brought into action, than they relax; the disagreeable contortion vanishes; the face recovers its natural appearance and expression; mastication, essential to perfect digestion, is freely and efficiently performed; the power of enunciation perfectly restored; and the patient is amply repaid for the slight inconvenience to which he was at first subjected.

In concluding this attempt to elucidate a subject of such paramount importance to every class of the community, I cannot do better than submit an extract from one of Mr. Tomes's excellent Lectures, delivered at the Middlesex Hospital; as it conveys exactly my own ideas upon the subject, and is at the same time, manly, straight-forward, and unequivocal. Every honourable dental practitioner

is indebted to Mr. Tomes, for the manner in which he has so effectually torn away the the mantle in which Charlatanism has, for so long a time, hidden its deformity; and thus enabled persons who have lost their teeth, to know what they may, and what they may not, expect from their artificial restoration:—

“ You might at first thought suppose that artificial teeth, when well made, would require no after-adjustment to the mouth; and in many cases they do not,—in others they require but very little: yet, again, they may require a great deal; and for the following reasons:—the base may press equally on all parts of the gums, but all parts may not bear pressure equally. Then, again, some parts of the jaw may be covered with a greater thickness of gum than others. Under pressure the thicker parts of the gum will yield, and leave the thinner to sustain the pressure that should be equally distributed over the whole. The points so pressed on will necessarily become sore, unless the piece be adjusted to relieve them.

The first effect, on putting in a set of artificial teeth, is most unquestionably great *discomfort*; the mouth feels filled, the speech

rendered difficult and indistinct, and mastication impossible: yet, within a fortnight, or three weeks at most, and often within even a week, all those difficulties vanish, and the patient tells you he could not do without the new teeth. Distressing nausea is amongst the occasional early consequence of wearing artificial teeth, but this also subsides with a little patience.

“To masticate well with false teeth requires both time and perseverance, the ability being acquired sooner or later in proportion to the aptitude of the individual. But all may acquire it if the teeth be well made, and properly adjusted, so that pressure on them does not produce pain.

“There are a few persons, however, whose jaws are so formed, that sufficient available bearing surface for the base can scarcely be found. There are others, again, in whom the lining membrane of the mouth is so irritable, either naturally or from habits of intemperance, that the presence of artificial teeth cannot be borne—or, at least, without great effort. But if the effort be made and continued, and the teeth are good in construction, and well

adjusted, success, even in the most difficult cases, will be consequent.

“Artificial teeth must be regarded by the wearer as tools, the use of which have to be learned by patient trials. The first time you take up a joiner’s plane you cannot work it, nor would you expect to do so without previous practice ; so, with artificial teeth, you have no right to expect to masticate effectively with them until by practice you have learned their use. I would recommend that patients before they wear new teeth should carefully examine them in their several parts, and actions, and thus learn how they should be used, and what is to be expected of the teeth, and what is to be expected of themselves in acquiring the art of artificial mastication. If this expedient be adopted, many ill-conceived attempts, and consequent failures productive of disappointment, will be avoided.

“It is of great importance that you should know how to preserve false teeth, for in the absence of proper attention they are soon destroyed, and still sooner become offensive. The *wearer often seems singularly unconscious of the offensive odour arising from neglected teeth*

—not so, however, the bystander: he is almost poisoned by the offensive breath of his neighbour. Dentine is used in the construction of most sets of teeth, and this substance, you are aware, if neglected, is soon acted on by the saliva, and gradually suffers decomposition: hence arises the stench.

“I have told you on several occasions that dentine, when highly polished, resists the solvent action of the saliva. The patient should pay great attention to this point. The surfaces of the teeth should be well brushed with a little precipitated chalk, at least twice a day; and, after brushing, rubbed with a dry soft towel, or handkerchief, or a piece of wash-leather. By these means a beautifully polished surface may be retained.

“When not in the mouth, the teeth should be kept in a well-stoppered glass jar, filled with two-thirds of spirits of wine, and one-third water. The antiseptic quality of the spirit aids much in preserving the dentine, and, moreover, keeps them sweet. By great attention, cleaning and immersion in spirits of wine when out of use, artificial teeth will last quite as long again as they would if these means were neglected.

“Artificial teeth cannot be too well kept, but they can be very easily, and frequently are, too ill kept. If the base be gold, and the teeth mineral, still they should be well cleaned each day; if the base be gold, and the teeth dentine, there is yet greater need of frequent and careful cleaning. If the base be of dentine, and the teeth natural teeth, the piece will soon be destroyed if cleaning be neglected.

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“Artificial teeth should not, as a habit, be worn during the night, unless their presence is necessary to the comfort of the patient, or for the preservation of the remaining natural teeth. In either case it is desirable that the patient should have a set for the night—a set with a much smaller base than those used for mastication; and when practicable, a piece fitted to one jaw only, and extended to the opposite jaw for the gums to close on. All that is required of night-teeth is, that they shall keep the jaws apart. The surface of the gums is naturally uncovered bathed with saliva, and subject to friction; it is desirable, therefore, that it should be left free eight hours out of *the twenty-four*; and, if some part must be

covered even during the night-time, let that be as small as possible.

“It will be inquired, at what time of life, and under what circumstances, recourse should be had to artificial teeth, how much may reasonably be expected of them, and how long they will last? Artificial teeth should be adopted whenever the want of teeth is felt, whenever articulation becomes imperfect, or when mastication can no longer be performed by molar teeth. I say molar teeth, because some persons, when the grinders are lost, masticate with the incisor teeth, in which case the incisors are soon worn down, or the upper ones are driven outwards and loosened by the lower front teeth; and thus, by being forced into use for a purpose for which they are not fitted, are prematurely destroyed.

“If the wearer be a person of average perseverance and average conformation of mouth, he may expect to have articulation perfectly restored, and mastication of ordinary food rendered effective, by using well-designed and well-made artificial teeth.

“Then, as regards the durability of artificial teeth. This will vary with individuals, the

variation depending on the state of the saliva, the care with which they are cleaned and kept and used, and upon the material used in their construction ; also in a great degree on the manner in which they are made, whether ill or well. A well-made set will last out two ill-made sets. One or two teeth on a gold base will last an indefinite time — ten, fifteen, or twenty years, or they may require renewal in two years, depending on the state of the adjoining natural teeth.

Some people will wear a complete set ten years without renewal, while others wear them down in eighteen months. From three to four years is a fair average wear."

